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(54) **Optical multilayer disk, multiwavelength light source, and optical system using them**

(57) When a wavelength of a first laser beam (23) with which a first recording medium (17) including a first recording layer is recorded and reproduced is indicated as  $\lambda_1$  (nm), a wavelength of a second laser beam (24) with which a second recording medium (18) including a second recording layer is recorded and reproduced as  $\lambda_2$  (nm), the relationship between the wavelength  $\lambda_1$  and the wavelength  $\lambda_2$  is set to be expressed by  $10 \leq |\lambda_1 - \lambda_2| \leq 120$ . The first recording layer has a light absorptance ratio of at least 1.0 with respect to the wavelength  $\lambda_1$ . The light transmittance of the first recording medium (17) with respect to the wavelength  $\lambda_2$  is set to be at least 30 in both the cases where the recording layer is in a crystal state and in an amorphous state. In order to record and reproduce the optical multilayer disk with the above-mentioned characteristics, a multiwavelength light source with the following configuration is used. Wavelengths of fundamental waves with different wavelengths from injection parts formed at one end of a plurality of optical waveguides, which satisfy phase matching conditions different from one another and are formed in the vicinity of the surface of a substrate, are converted simultaneously, and the first and second laser beams are emitted from emission parts formed at substantially the same position at the other end of the optical waveguides. This enables an optimum optical system for high density recording and reproduction to be ob-

tained.

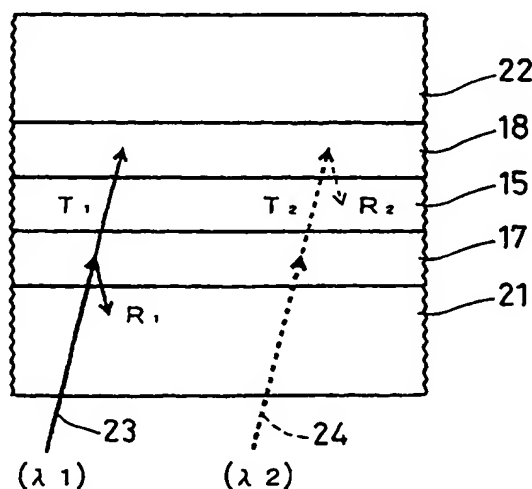


FIG. 4



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# EUROPEAN SEARCH REPORT

Application Number

EP 00 30 9359

DOCUMENTS CONSIDERED TO BE RELEVANT			
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Y	* column 4, line 13 - line 47; figure 2 * * column 6, line 6 - line 7 *	4,15	G02F1/37 G11B7/125 G11B7/135
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A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 09, 30 September 1996 (1996-09-30) & JP 08 127176 A (HITACHI LTD), 21 May 1996 (1996-05-21) * abstract *	9	
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A	* page 8, line 5 - page 18, line 6; figures 2-5,13,14 *	5,16,21, 35-50	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 October 2004	Examiner Wahl, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 30 9359

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 October 2004	Examiner Wahl, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			



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#### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

#### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION  
SHEET B

Application Number  
EP 00 30 9359

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-4,6-15,17

High transmittance

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2. claims: 5,16

Harmonic generation laser beam source

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3. claims: 18-25

Phase matched common emission waveguides

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4. claims: 26-50

Phase matching of harmonic generation waveguides

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 30 9359

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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19-10-2004

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